A Constraint-Based Geospatial Data Integration System for Wildfire Management, Phase I

Completed Technology Project (2005 - 2005)

Project Introduction

We propose to develop a constraint-based system for automatically integrating online, heterogeneous data sources with geospatial data produced by NASA in order to allow users to easily analyze terrestrial phenomena, such as wildfires. Current commercial technology permits only limited types of integration - usually between structured databases - in this regard. However, particularly with the emergence of the Internet, there now exist an enormous number of other online information sources that can be combined with maps, MODIS products, and other geospatial products in order to better assist human analysis. In this project we will extend an existing constraint-based data integration system that we previously developed to allow users to easily integrate online data, annotate and extend that data (to add a layer of "knowledge" on top of the raw data), and rapidly identify updates to data. This will result in a concise, rich, integrated interface that allows one to more easily and quickly analyze complicated phenomena. We intend to demonstrate the feasability of this approach in the context of a real application, wildfire management and pre-season planning.

Anticipated Benefits

The technology described will allow online, heterogeneous data sources to be integrated with geospatial data in a customized fashion, an important capability for our existing military and government customers. In addition, this technology is critical for a new market we are exploring - situation monitoring for emergency planning and response. The project will directly explore a specific application area, wildfire management and pre-season planning, where NASA products are of critical importance. The project team will collaborate with end users at the Okanogan-Winatchee National Forest, as well as with members of the Ecological Forecasting group at NASA Ames who are developing new data products relevant to wildfire prevention.

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:
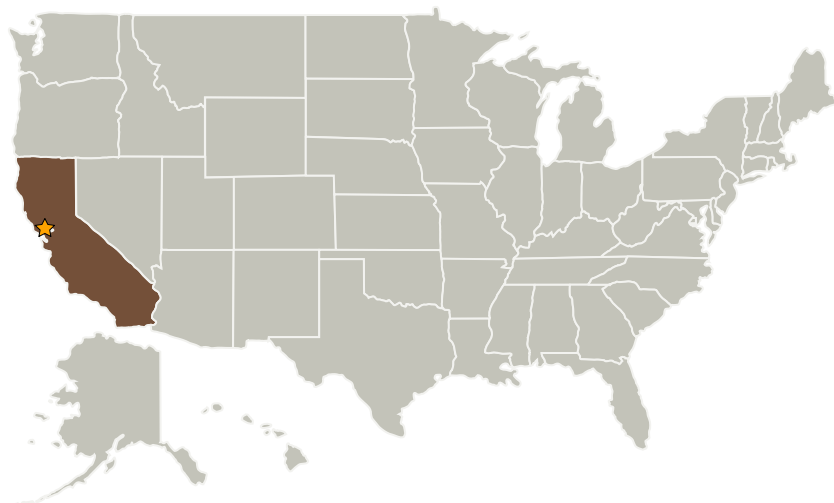
Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

For more information and an accessible alternative, please visit:
https://techport.nasa.gov/view/5587

Primary U.S. Work Locations and Key Partners

Organizations Performing Work	Role	Type	Location
⭐Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Fetch Technologies	Supporting Organization	Industry	El Segundo, California

Primary U.S. Work Locations
California

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Project Manager:
James A Brass

Principal Investigator:
Steven Minton

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  └ TX11.4 Information Processing
    └ TX11.4.2 Intelligent Data Understanding